

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

Paper No. 25

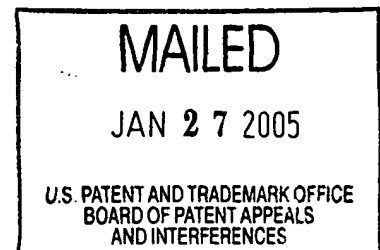
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JUKKA HAAPANIEMI
and MARKKU JARVINEN

Appeal No. 2005-0065
Application 09/367,108

ON BRIEF



Before WARREN, WALTZ and PAWLIKOWSKI, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

Decision on Appeal

This is an appeal under 35 U.S.C. § 134 from the decision of the examiner finally rejecting claims 18 through 23, all of the claims in the application.

Claim 18 illustrates appellants' invention of a spirally wound paperboard core comprising a plurality of structural plies, wherein at least one structural ply has the specified modulus of elasticity in the machine direction and in the cross machine direction, exhibiting the specified squareness ratio, and is representative of the claims on appeal:

18. A spirally wound paperboard core comprising a plurality of structural plies made of paperboard manufactured by a press-drying process under simultaneous application of heat and pressure, at least one said structural ply having a machine direction modulus of elasticity of at least 7500 MPa, and a cross machine direction modulus of elasticity greater than 4500 MPa, and wherein said at least one structural ply exhibits a squareness of less than 2.40, wherein the

squareness is a ratio between the machine direction modulus of elasticity and the cross machine direction modulus of elasticity.

The reference relied on by the examiner is:

Qiu et al. (Qiu) 5,505,395 Apr. 9, 1996

The examiner has rejected appealed claims 18 through 23 under 35 U.S.C. § 103(a) as being unpatentable over Qiu.¹

Appellants state that the appealed “[c]laims 18-23 may be considered to be grouped as standing or falling together” (brief, page 3). Thus, we decide this appeal based on appealed claim 18. 37 CFR § 1.192(c)(7) (2003); *see also* 37 CFR § 41.37(c)(1)(vii) (effective September 13, 2004; 69 Fed. Reg. 49960 (August 12, 2004); 1286 Off. Gaz. Pat. Office 21 (September 7, 2004)).

We reverse.

Rather than reiterate the respective positions advanced by the examiner and appellants, we refer to the answer and to the brief and reply brief for a complete exposition thereof.

Opinion

We interpret appealed claim 18 by giving the terms thereof their broadest reasonable interpretation in light of the written description in appellants’ specification, including the drawing, as it would be interpreted by one of ordinary skill in this art, without reading into the claim any limitation or particular embodiment disclosed in the specification. *See In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989); *In re Priest*, 582 F.2d 33, 37, 199 USPQ 11, 15 (CCPA 1978).

The plain language of claim 18 specifies that the spirally wound paperboard core product comprises at least a plurality of structural plies made of paperboard which has been manufactured by a press-drying process under simultaneous application of heat and pressure. This product-by-process limitation characterizes the claimed product and, therefore, must be given weight in applying prior art. However, any paperboard which has the characteristics of

¹ The examiner withdrew the ground of rejection of appealed claim 18 under 35 U.S.C. § 112, second paragraph (answer, page 5).

paperboard manufactured by said process, even if not so manufactured, are encompassed by the claim. *See generally, In re Thorpe*, 777 F.2d 695, 697, 227 USPQ 964, 966 (Fed. Cir. 1985). The claim further specifies the modulus of elasticity of at least 7500 MPa, that is, any MPa of 7500 MPa and above, in the machine direction, and of greater than 4500 MPa, that is, any MPa above 4500 MPa, in the cross machine direction, with a squareness ratio of less than 2.40, that is, any ratio below 2.40. The transitional term “comprising” opens the claim to encompass spirally wound paperboard cores that contain other plies and additional materials. *See generally In re Baxter*, 656 F.2d 679, 686-87, 210 USPQ 795, 802-03 (CCPA 1981) (“As long as one of the monomers in the reaction is propylene, any other monomer may be present, because the term ‘comprises’ permits the *inclusion* of other steps, elements, or materials.”).

We find that Qiu acknowledges that one way to increase the overall strength of paperboard tubes or cores is to employ stronger paper strips for the plies, wherein paper strength is improved by, among others, “compressing the paperboard during manufacture,” and that the density, that is, the higher the density the stronger the paperboard, as well as the orthotropic properties of the paperboard, that is, the strength properties in the machine direction and in the cross machine direction, are among factors that influence tube strength (col. 1, l. 61, to col. 2, l. 4). Qiu teaches that the disclosed cores have structural plies from paperboard of different densities (e.g., cols. 3-10). Qiu describes a tube computer model in which the high density plies are prepared from paperboard that has a density about 6% greater than the paperboard in the low density plies, wherein “[t]he [high density] paperboard is assumed to have moduli 50% greater than the [low density] paper,” and is further “assumed to have the properties set forth in Table I” (col. 9, l. 54, to col. 10, l. 14). By our calculation in MPa units, the high density plies have a modulus of elasticity of 10,893 MPa in the machine direction and a modulus of elasticity of 3,654 MPa in the cross machine direction, and on this basis, the tube has a squareness ratio of 2.98. We note here that the low density plies in Table I have a modulus of elasticity of 7,239 MPa in the machine direction and a modulus of elasticity of 2,413 MPa in the cross machine direction, and on this basis, the tube has a squareness ratio of 3.0. Qui states that “it is to be noted that the two paper densities used in the computer model corresponds generally to

commercially available paperboards of moderately low to moderately high strength” (col. 10, l. 29-32).

The examiner recognizes that the modulus of elasticity in the machine direction of the high density ply of the tube computer model of Qiu falls within the claimed range, and that the modulus of elasticity in the cross machine direction and the squareness are outside of the respective claimed ranges (answer, page 3). The examiner finds that “the cross machine direction modulus of elasticity and squareness would be readily determined through routine optimization by one having ordinary skill in the art depending on the desired end use of the product as shown by [Qiu] in Table I,” and thus takes the position that it would have been obvious for one of ordinary skill in the art to vary the cross machine direction modulus of elasticity and squareness, in the absence of unexpected results, citing *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) (answer, pages 3-4). With respect to the other paperboard limitation, the examiner finds that “[t]he method of manufacturing the paperboard (product-by-process) is given little patentable weight in the product claim,” requiring appellants “to demonstrate, by verified showing, the unexpected advantages accruing from the method of manufacture as claimed” (answer, page 4).

Appellants submit that the solution to the problem of core stiffness is “at least one ply that has been manufactured of coreboard made by a specific press drying method known as the Condebelt-method [footnote omitted],” which provides the claimed modulus of elasticity in the cross machine direction combined with the claimed modulus of elasticity in the machine direction and the squareness ratio, pointing out that Qui does not satisfy any claim limitation other than the modulus of elasticity in the machine direction (brief, pages 6-8). Appellants argue that there is no direction in Qiu to use the Condebelt method produced paperboard or to consider the modulus of elasticity in the cross machine direction, contending that the problem address by Qiu is not that confronted by appellants in which this property is important (brief, pages 9-10).

The examiner responds by maintaining the position that from the disclosure of the high density ply in the tube computer model of Qiu, the “cross machine direction of modulus of elasticity and squareness would be readily determined through routine experimentation” (answer, page 5). The examiner points out that certain core properties are not claimed and that according

to appellants' disclosure, one of the problems addressed by appellants is the same problem addressed by Qiu (answer, pages 6-7). The examiner maintains the position that the method of making the paperboard specified in claim 18 is entitled to little patentable weight (answer, page 7). With respect to appellants' argument that there is no direction to consider the modulus of elasticity in the cross machine direction, the examiner takes the position that Qiu discloses "a paperboard core having a specific modulus of elasticity in the cross machine direction, indicating that the modulus of elasticity in the cross machine direction is not irrelevant" (answer, page 8).

We initially note that it seems to us appellants' position is that paperboard prepared by the Condebelt process involving press-drying as required by appealed claim 18, provides paperboard which can be used to prepare a ply having the specified modulus of elasticity in the two machine directions, and in the specified squareness ratio. We find no basis in the specification or in the language of claim 18 on which to read the Condebelt process limitation into the claim. *See Morris, supra; Zletz, supra; Priest, supra*. Indeed, appellants disclose that "[s]tructural plies manufactured with other appropriate methods and meeting the strength requirements according to the invention can also be utilized in constructing a paperboard core" (specification, sentence bridging pages 6-7). Thus, on this record, cores from paperboard that provides plies having the combination of moduli of elasticity and squareness fall within the claim, even if the "press-drying process" is not used to produce the paperboard.

In order for Qiu alone to render obvious the claimed paperboard core encompassed by appealed claim 18 as we have interpreted this claim above, within the meaning of § 103(a), there must be some teaching in the reference or other knowledge generally available to one of ordinary skill in this art which would have led that person to invention as a whole as claimed, including all of the limitations thereof, without recourse to the teachings in appellants' disclosure. Thus, this person must either have found direction to the claimed invention within the disclosure of Qiu or would have modified the disclosure of the reference based on information provided therein or on other knowledge established to be known in the art. *See generally, In re Rouffet*, 149 F.3d 1350, 1358, 47 USPQ2d 1453, 1458 (Fed. Cir. 1998); *Pro-Mold and Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1629-30 (Fed. Cir. 1996); *B.F. Goodrich Co. v. Aircraft Braking Sys. Corp.*, 72 F.3d 1577, 1582, 37 USPQ2d 1314, 1318 (Fed. Cir. 1996)

("When obviousness is based on a particular prior art reference, there must be a showing of a suggestion or motivation to modify the teachings of that reference. [Citation omitted.] This suggestion or motivation need not be expressly stated. [Citation omitted.]"); *In re Fine*, 837 F.2d 1071, 1074-76, 5 USPQ2d 1596, 1598-1600 (Fed. Cir. 1988); *In re Dow Chem. Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988) ("The consistent criterion for determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that [the claimed process] should be carried out and would have a reasonable likelihood of success viewed in light of the prior art. [Citations omitted] Both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure."); *In re Geerdes*, 491 F.2d 1260, 1262-63, 180 USPQ 789, 791-92 (CCPA 1974) (In considering grounds of rejection under 35 U.S.C. §§ 103 and 112, "every limitation in the claim must be given effect rather than considering one in isolation from the others.").

Here, the examiner relies solely on the disclosure of the modulus of elasticity in the cross machine direction in Qiu as evidence that this measurement along with the squareness ratio are result effective variables. However, while it is clear from Qiu that the modulus of elasticity in the cross machine direction and the squareness ratio is measured, we agree with appellants that the reference contains no disclosure which would have, without more, led one of ordinary skill in this art to modify either of these measurements in the low or high density plies to arrive at a value for either measurement that falls within the claimed range for that measurement with respect to paperboard having the characteristics of paperboard manufactured as specified within appealed claim 18. Indeed, the reference is interested in plies of different densities, that is, strengths, with respect to the problems addressed, and there is no guidance with respect to modifying either the high density plies, relied on by the examiner, or the low density plies in Qiu Table I, neither of which have a modulus of elasticity in the cross machine direction or a squareness ratio that falls within the ranges specified in claim 18, and the low density also does not have a modulus of elasticity in the machine direction which falls within the claim, in a manner directed to any or all of these values, such as a range for these measurements.

We do not find that the facts of this appeal are those of *Boesch* wherein a predecessor to our reviewing court stated:

Considering, also, that the *composition requirements of the claims and the cited references overlap*, we agree with the Solicitor that the prior art would have suggested 'the kind of experimentation necessary to achieve the claimed composition, including the proportional balancing described by appellants' Nv equation.' This accords with the rule that discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Aller, 220 F.2d 454, 105 USPQ 233 (CCPA 1955). [617 F.2d at 276, 205 USPQ 219; emphasis supplied.]

It is axiomatic that there must be some direction in the prior art relied on which would have led one of ordinary skill in the art to the claimed invention, as was the case in *Boesch* wherein the reference taught the same compositions as claimed in the region of overlap. Indeed, the absence of direction to the claimed ranges or a value falling therein along with the characteristics imparted by the specified method of manufacture of the paperboard in Qiu leads to the conclusion that the rejection based on Qiu alone is founded upon an impermissible standard of "obvious to try" when weighed by the first test set forth in *In re O'Farrell*:

The admonition that "obvious to try" is not the standard under § 103 has been directed mainly at two kinds of error. In some cases, what would have been "obvious to try" would have been to vary all parameters or try each of numerous possible choices until one possibly arrived at a successful result, where the prior art gave either no indication of which parameters were critical or no direction as to which of many possible choices is likely to be successful. [citations omitted] [853 F.2d 894, 903, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988).]

In this respect, more akin to the facts of the present appeal are those of *In re Sebek*, wherein the predecessor to our reviewing court stated:

[W]hile it may ordinarily be the case that the determination of optimum values for the parameters of a prior art process would be at least prima facie obvious, that conclusion depends upon what the prior art discloses with respect to those parameters. Where, as here, the prior art disclosure suggests the outer limits of the range of suitable values, and that the optimum resides within that range, and where there are indications elsewhere that in fact the optimum should be sought within that range, *the determination of optimum values outside that range may not be obvious*. [465 F.2d 904, 907, 175 USPQ 93, 95 (CCPA 1972); emphasis supplied.]

Accordingly, on this record, we find that the examiner has failed to establish a *prima facie* case of obviousness under § 103 over Qiu and, therefore, we reverse the rejection of appealed claims 18 through 23 under this statutory provision.

The examiner's decision is reversed.

Remand

Pursuant to our authority under 37 CFR §§ 41.50(a)(1) and 41.50(b),² we remand this application to the examiner to compare the claimed paperboard core encompassed by all of the claims of record with the acknowledged prior art in appellants' specification (page 4, l. 13, to page 5, l. 15), along with any other applicable prior art developed by the examiner in this respect, and enter such ground or grounds of rejection under the appropriate statutory provision as the examiner considers necessary.

It seems to us that the acknowledged prior art in the specification indicates that paperboard which is homogeneous with the desired squareness of 1 is not obtainable because the strength in the machine direction is "typically 1.6-2.7 times stronger" than in the machine direction which "applies to the elasticity of modulus of paperboard as well" (page 4, ll. 13-20); and that "[t]he elasticity moduli of typical paperboard materials for rotogravure cores, which have expedient squareness, are . . . for the higher strength class materials . . . about 6500 to 7500 MPa in the machine direction and about 3500 to 4000 MPa in the cross machine direction" (page 5, ll. 10-15). The machine direction to cross machine direction squareness ratio in the latter acknowledgment is in the range of 1.625 – 2.143, and is similar to the range of typically 1.6 – 2.7 when the elasticity moduli in these directions is considered in the former acknowledgment.

Indeed, a squareness of 1.625 where the machine direction has a modulus of elasticity of 7500 MPa would be achieved with a modulus of elasticity in the cross machine direction of 4616 MPa. A paperboard core with structural plies having such parameters would fall within at least appealed claim 18 if the paperboard is established to have the characteristics imparted by the

² Effective September 13, 2003; 69 Fed. Reg. 49960 (August 12, 2004); 1286 Off. Gaz. Pat. Office 21 (September 7, 2004). This remand is not for the purpose of further consideration of a rejection advanced on appeal, and accordingly, the provisions of 37 CFR § 41.50(a)(2) do not apply.

method of manufacture specified therein.

While the thus arrived at modulus of elasticity in the cross machine direction of 4616 MPa would appear to be a reasonable extension of the typical range of such modulus of elasticity of 3500 to 4000 MPa, there must be evidence of paperboard which in fact has such a measurement above 4000 MPa added to the record to support a ground of rejection.

Accordingly, the examiner is required to take appropriate action consistent with current examining practice and procedure consistent with our discussion above.

We hereby remand this application to the examiner, via the Office of a Director of the Technology Center, for appropriate action in view of the above comments.

This application, by virtue of its “special” status, requires immediate action. *See* MPEP § 708.01(D) (8th ed., Rev. 2, May 2004; 700-127). It is important that the Board of Patent Appeals and Interferences be informed promptly of any action affecting the appeal in this case. *See, e.g.,* MPEP§ 1211 (8th ed., Rev. 2, May 2004; 1200-30).

Reversed

Remanded

[Handwritten signature]

CHARLES F. WARREN
Administrative Patent Judge

THOMAS A. WALTZ

THOMAS A. WALTZ
Administrative Patent Judge

BOARD OF PATENT APPEALS AND INTERFERENCES

Beverly A. Lawless

BEVERLY A. PAWLIKOWSKI
Administrative Patent Judge

Appeal No. 2005-0065
Application 09/367,108

Nixon & Vanderhye, PC
1100 N. Glebe Road
8TH Floor
Arlington, VA 22201-4714